

Research Communications Strategy

3rd Report to JISC - December 2010

**Current Issues in Research Communications:
Adding Value and Sharing Research**

Bill Hubbard, Head of the CRC,
JISC Research Communications Strategist

Amanda Hodgson, Open Access Advisor

Willow Fuchs, Open Access Advisor

Centre for Research Communications
University of Nottingham

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Introduction

This report is in two distinct, but connected, sections. They address a common theme: the scope of current OA practice and the opportunities it offers for innovation in scholarly communication methods.

Section 1 takes as its starting point the apparent reluctance of individual academics fully to embrace OA, and suggests that the potential offered by OA for various kinds of added value might be an effective tool in advocacy.

Section 2 considers the relation of OA to services such as Mendeley, and wonders whether our established view of OA as a way to distribute traditional research outputs more efficiently might come to seem outmoded in the face of new, non-traditional ideas about how to conduct and disseminate research.

Section 1: Open Access and Added Value

1.1 Open Access: the battle won?

As the title of a recent event put it, "Where do we go to from here?"¹ When talking about scholarly communication, some major figures believe that it is becoming possible to suggest that the OA battle, at least in theory, has largely been won. This view was expressed by several speakers in October 2010, at the first of a series of discussions on Research Information in Transition, organised by RIN. Robert Kiley, Head of Digital Services at the Wellcome Trust, surveying changes in OA practice over the last five years, drew attention to the existence of funders' and institutional mandates, to OA journals (for example *PLoS ONE*) becoming increasingly mainstream, to the growth of repositories, to increases in institutional funding for OA publication and to a move towards open peer review.² Philip Sykes, Librarian of Liverpool University, claimed that while five years ago senior managers saw OA as a kind of eccentricity, now most of them are cautiously in favour – recognising its value for the REF, for increasing citations, for contributing to potential financial savings, especially on the journals budget, and for maximising social and economic impact.

However, while the intellectual battle may be seen by some to have been won, the adoption of the practice of OA still seems distant. Indeed many of the intellectual issues from the debate of the past 10 years – concerns about peer review, for example, or plagiarism – are still live topics amongst researchers. It is also possible to recognise a general inertia within the status quo. Are the developments in policy and the growth of "buy-in" from senior university managers³ having an effect on the publication practice of individual academics? Some see change on the ground. In a scholarly communications supplement to the *New Review of Academic Librarianship*, Hazel Woodward confidently states:

¹ The subtitle of The Future of Scholarly Publishing, the first of a series of discussions on Research Information in Transition, organised by RIN, Royal College of Physicians, October 11, 2010.

² Slides of the presentation are available on Slideshare at <http://www.slideshare.net/sarahgentleman/the-future-of-scholarly-publishing-where-do-we-go-from-here>

³ ROARMAP records existing or proposed OA mandates from 23 HEIs and 3 individual Schools or Departments (<http://www.eprints.org/openaccess/policysignup/> [accessed 30/11/10]).

Without doubt, the scholarly communication process is changing. Open access is clearly beginning to impact traditional publishing models, challenging commercial and not-for-profit journals and book publishers alike. ... Academics [*sic*] attitudes to open access are changing ...⁴

But then she adds 'albeit slower than many might have hoped'. The Wellcome Trust reports that compliance with its mandate runs at around 50%.⁵ For every statement about the mainstreaming of OA, there is another indicating that obstacles to uptake still exist. Stephen Pinfield, CIO at the University of Nottingham, speaking at a JISC/UUK conference on The Future of Research, identified the following as issues that may deter academic staff from choosing OA options:

- quality assurance
- IP and copyright
- time constraints
- the undermining of tried and tested systems.⁶

These are the concerns that are commonly cited as barriers to the adoption of OA, and it seems clear that advocacy still has some way to go if these barriers are to be fully broken down. A recent study endorses the view that OA is far from being widely and comfortably accepted by researchers:

in general, little has changed from the researchers' perspective over the last five years ... there remain barriers to the wholesale adoption of this new model of scholarly publishing, not the least on the part of the researchers who produce the material, with confusion over exactly what is meant by open access and concern as to the quality of material made available.⁷

This is confirmed by the initial results of the RCS' programme of involvement with academics. At a seminar for research staff and research students at the University of Manchester⁸ there was a general acceptance of the desirability of research reaching a wider audience. However attendees were anxious about a number of issues which broadly fell into three categories:

- concerns about copyright and plagiarism
- concerns about peer review and a lack of "quality control"
- concerns about the (consequent?) lack of status attached to OA publications.

One attendee was adamant that paid-for Gold OA was merely "vanity publishing". Similar issues were raised at a seminar for research-active staff in

⁴ Woodward, Hazel, 2010. Dissemination models in scholarly communication. *New Review of Academic Librarianship*, 16/1, 1-3, p.1. DOI: 10.1080/13614533.2010.514763

⁵ Robert Kiley, at the event referred to above.

⁶ Stephen Pinfield, speaking at the Congress Centre, October 19, 2010. A summary and video of his presentation is available at <http://jiscres10.jiscinvolve.org/wp/efficiency-open-access-making-the-most-of-your-research-jiscres10/> [accessed 25/10/10].

⁷ Creaser, Claire, 2010. Open access to research outputs - institutional policies and researchers' views: results from two complementary surveys. *New Review of Academic Librarianship*, 16/1, 4-25, p.24. DOI: 10.1080/13614530903162854

⁸ Seminar conducted by AH, October 28, 2010. There were around 25 participants from all subject areas, but with a large majority from the physical sciences.

the School of Nursing, Midwifery and Physiotherapy at the University of Nottingham.⁹

In order to obtain further evidence from the academic community we are about to launch a survey addressed to 738 academics working in the Chemistry and Economics departments of 11 HEIs. The questions are designed to elicit opinions on, as well as examples of practice of, OA in these disciplines, and to form the basis for more in-depth discussions through one-to-one interviews or focus groups. It may be that we shall uncover a wide range of attitudes to OA. However our contact so far with individual academics reinforces the views expressed by the commentators quoted above – that even if persuaded of an intellectual case for OA, many researchers are reluctant to embrace what they see as a radical and untested alteration in the established methods of disseminating the results of their work.

1.2 The challenge of advocacy

How then can we as a development community combat the lingering objections to OA among academics? In the past advocacy has concentrated on stressing citation advantages, largely in numeric terms. Metrics have been employed to demonstrate that when researchers use open access, their citation count goes up. Is it time to shift the focus from quantity of citations to quality? Our discussions are showing that researchers are not simply interested in the number of their citations: they need to be sure that the citations refer back to a publication that has high status in their field. Their reputations, and thus their career development, depend on the respect of their peers; and the way this respect is generated and evidenced is tightly tied up with the traditional publishing system.¹⁰

Researchers need to be reassured that Green OA does not imply the absence of peer review. (Unless of course we wish to promote the redundancy of traditional peer review in the digital age. A recent substantial and entertaining (but anonymous) blog post makes a case for a radical revision of the process of authenticating scholarly discourse. The author describes experiments in crowd-sourcing peer review, and other initiatives 'at the intersection of scholarly collaboration and open access publishing'.¹¹ Related to this is Cameron Neylon's proposal for a study of alternative evaluation methods for scholarly research that will go beyond the current 'prestige based metrics'.¹²)

⁹ Seminar conducted by AH, November 3, 2010. There were 8 participants. It should be said that for participants in a seminar led by WF for the National Biomedical Research Unit in Hearing (November 15, 2010), who are required to make their work available in UK PubMed Central, cost was the most compelling issue.

¹⁰ See also Morris, Sally & Thorn, Sue, 2009. Learned society members and open access. *Learned Publishing*, 22/3, 221–39. DOI:10.1087/2009308

¹¹ Anon, 2010. *Open Access, Open Secrets: Peer Review and Alternative Scholarly Production*, Victoria Telecom, weblog post, October 11, accessed 29/10/2010, <http://victелеcom.wordpress.com/2010/10/11/open-access-open-secrets-peer-review-and-alternative-scholarly-production/>. A little detective work identifies the author as Paul Fyfe, Assistant Professor in the Department of English at Florida State University.

¹² In the Google doc *Beyond the impact factor: linking funder needs to the development of new research metrics*, https://docs.google.com/document/edit?id=1I32FjbfbkykwMbN75FfVqxSxqhINfR9JuQGLrUCauFA&hl=en_GB&authkey=CM-Ok9kC&pli=1#, Neylon lists JISC as a potential funder for this work

Similarly, when discussing Gold OA it is not enough to indicate in general terms the potentially wider audience for research output. What researchers wish to be sure of is that OA journals are not a “second-class breed” with which it could be pointless, or in career terms even positively harmful, to be associated. Some OA journals are gaining in reputation. *PLoS Biology* currently enjoys the highest impact factor of all biology journals indexed in WoK.¹³ Yet unless or until OA journals assume a similar position of significance in other subject areas, academics will tend to be wary of committing their work to OA publication.

What we are dealing with here are often not so much rational objections as subjective feelings which by their nature are both difficult to combat and highly influential on the behaviour of those who hold them. They may even be unvoiced and identifiable only by inference. As has been shown by attempts to change behaviour in relation to developing views on climate change, the mere presentation of ideas, however apparently compelling, does not necessarily result in action.¹⁴ Common perceptions among the academic and publishing communities¹⁵ create “cultural wrappers” that must be removed, or their significance challenged, if the advocates of OA are to succeed.

1.3 Success through added value?

Is it possible that those academics who still resist OA might be persuaded by its potential for adding value to their research output? Recent contributions to the JISC conference on the Future of Research suggested that there has been a failure to engage with the full potential impact of OA. Responding to a question, Martin Hall, VC of Salford University, remarked: ‘We haven’t got the message through to vice chancellors in significant numbers. The issue of open access is being narrowly contained as a research issue around publications – but it speaks to the open content agenda too. We have been a victim of compartmentalisation.’

This view was endorsed by Wim Leibrand, chief executive of the SURF foundation in the Netherlands:

It is highly interesting to ask the question ‘how will we develop and build an information infrastructure to deal with the new emerging data intensive research questions?’ If you want to profit from all the technologies we have at the moment then it does make sense to put an open-access

[accessed 10/11/10]. JISC is broadly supportive but is not at present funding it. Neylon recognises the connection with the uptake of OA options: ‘It is widely thought that effecting the desired cultural changes towards openness in the research community depends on creating the right incentives.’

¹³ 12.916. *PLoS ONE*, also an OA journal, is 10th with an impact factor of 4.351 – though in the case of *PLoS ONE* its impact is skewed by the huge number of articles it publishes.

¹⁴ See Genovese, Jane, 2008. Behaviour Change for Combating Climate Change. <http://learningfundamentals.com.au/wp-content/uploads/behaviour-change-for-combating-climate-change.pdf> [accessed 30/11/10].

¹⁵ For example, that serious scientists must publish in high-profile journals irrespective of OA status.

archive at the heart of the university - and that can add real value not only to researchers at the institutions but also to society as a whole.¹⁶

This potential to add value is currently being exploited by a number of initiatives. For example, *PLoS ONE* is showcasing “hubs” that import OA journal articles and enhance them with added data. The hubs also invite comment and discussion:

The vision behind the creation of PLoS Hubs is to show how open-access literature can be reused and reorganized, filtered, and assessed to enable the exchange of research, opinion, and data between community members.¹⁷

So the pilot hub, in the field of biodiversity, links from articles to information about the species referred to – providing, for example, taxonomies, images, descriptions and maps showing where the species is located.¹⁸ Can developments such as this be a way forward for OA?

As we have seen with the continuing popularity of social networking tools and the growth of sharing sites such as Mendeley,¹⁹ there is an appetite for forums that allow exchange of views and ideas.²⁰ Some of the implications of this are addressed below (Section 2), but seeing this popularity in terms of promoting the use of OA, might it be that advocacy built round the idea of “adding value” would have an effect on academics’ practice that concentration on citations has so far failed to do? There could be a double approach: continuing to present the arguments on citations, peer review and quality but also reaching out to support and draw attention to other initiatives that are exploiting the full potential of open access.

1.4 Open Access adding value in institutions

Earlier focus by JISC and others on the economic costs and benefits of OA to HE institutions appears to continue to bear fruit.²¹ Another way in which OA can add value to an institution is in relation to the implementation of integrated research management systems. JISC, through its Research Information Management programme, has been active in encouraging the development of CRIS systems and associated technical developments. For example, the recently completed CRISPool project, partly funded by JISC, has shown the suitability of CERIF-XML for collating data on ‘people, organisations and publications’ in three Scottish

¹⁶ Both these statements are quoted from The future of research in tough times. Report of the JISC Future of Research conference *Research Information* 29/10/10 http://www.researchinformation.info/news/news_story.php?news_id=669 [accessed 1/11/10].

¹⁷ <http://hubs.plos.org/web/biodiversity/about> [accessed 26/10/10].

¹⁸ From the point of view of advocacy to academics, it is perhaps unfortunate that the link to further information leads to Wikipedia. But of course this at least means that everyone with an internet connection will be able to read it.

¹⁹ At the time of writing Mendeley claims to be providing access to 51,961,047 papers. <http://www.mendeley.com/> [accessed 30/11/10].

²⁰ As the SNEEP project has shown, repositories can themselves become sites for the creative sharing of ideas. http://sneep.ulcc.ac.uk/wiki/index.php/Main_Page [accessed 22/11/10].

²¹ See for example Stevenson, Adam, 2010. The economic case for open access in academic publishing, *Ars Technica*, weblog post, November 29, accessed 30/11/10, <http://arstechnica.com/science/news/2010/11/the-economic-case-for-open-access-in-academic-publishing.ars?comments=1#comments-bar>

universities.²² The EXRI-UK project, whose final report recommended the adoption of the CERIF format for the exchange of research information,²³ has led to both strategic and practical developments: HEFCE 'has indicated that REF submissions may be made using the CERIF format',²⁴ and the Readiness for REF project reports successful trials of a CERIF schema in pilot projects within institutions.²⁵ Building on earlier reports,²⁶ JISC is currently funding a portfolio of further projects in relation to integrating, publishing and managing research data across institutions. These include the Institutional Data Management Blueprint Project, working on an institutional framework for managing research data at the University of Southampton;²⁷ and Embedding Institutional Data Curation Services in Research, a project on the curation and management of research data at the University of Oxford.²⁸

It is too early to tell precisely what effect these projects will have within the HE community –they are either ongoing or very recently completed. However it would seem that JISC has identified scope for significant impact. The RCS would concur. One of the findings that emerged from our workshops on the cost of OA was that there is a perceived need among librarians, research managers and repository managers for a more "joined-up" relationship to foster seamless management of research. The CRC is responding by hosting an event in January 2011. Colleagues from the Universities of Glasgow, St Andrews and Newcastle will share their experiences of implementing integrated research management systems and contributions will also be made by Stephen Pinfield from the University of Nottingham, speaking on institutional funding for OA publication, and by funders' representatives. The event²⁹ is jointly sponsored by RLUK, SCONUL and ARMA and aims to bring together senior representatives of all these communities to foster strategic and practical collaboration.

1.5 Open Access adding value in arts and humanities research: non-text materials

Conventional wisdom suggests that researchers in the arts and humanities are less likely than their scientific colleagues to take up OA options. This is borne out by institutional repository usage statistics: at Nottingham, for instance, Faculty of Arts staff have deposited 43 items as opposed to 198 from the Faculty of

²² Clements, A. & Lockhart, Niall, 2010. *CRISPool Project: Using CERIF-XML to integrate heterogeneous research information from several institutions into a single portal*. <http://www.st-andrews.ac.uk/crispool/media/crispool%20final%20report%20v2.1%20with%20appendices.pdf>

²³ Rogers, Nikki, Huxley, Lesly & Ferguson Nicky, 2009. *Exchanging Research Information in the UK*. http://ie-repository.jisc.ac.uk/448/1/exri_final_v2.pdf

²⁴ From a JISC briefing paper: <http://inf11briefingoct2010.jiscpress.org/research-information-management/> [accessed 15/12/10].

²⁵ <http://r4r.cerch.kcl.ac.uk/> [accessed 15/12/10].

²⁶ Eg Fry, Jenny, Lockyer, Suzanne, Oppenheim, Charles *et al*, 2008. *Identifying benefits arising from the curation and open sharing of research data produced by UK Higher Education and research institutes*. http://ie-repository.jisc.ac.uk/279/2/JISC_data_sharing_finalreport.pdf; and Rightscom Ltd, 2009. *A project to identify successful models for embedding repositories in research management systems and processes within higher education institutions*. http://ie-repository.jisc.ac.uk/408/2/embedding_repositories_in_research_management_systems_final_report_20090923.pdf

²⁷ <http://www.southamptondata.org/index.html>

²⁸ <http://eidcsr.oucs.ox.ac.uk/index.xml>

²⁹ <http://crc.nottingham.ac.uk/events/?page=Researchmanagement-2011-01-27>. The enthusiasm with which this event was greeted by potential delegates (almost twice as many people applied to attend as we have room for) suggests a perceived need in the community for further exploration of this area.

Medicine and Health Sciences and 430 from the Faculty of Science. Despite the fact that staff numbers in the Faculties of Arts and Science are roughly similar, the number of deposits from Arts is only a tenth of those from Science.³⁰ This disinclination to deposit is linked to a publication culture that prioritises book publication over journal articles. Arts and humanities researchers also produce, however, output in non-textual forms: for example images, music, performances and exhibitions; and it is often the case that these are the very outputs likely to figure in any assessment of institutional impact. OA repositories can provide a central place for the preservation and dissemination of such outputs and can be used to link non-textual items to research articles in a way that enhances both.

This is already happening at, for instance, the University of the Arts London, where the repository accepts deposits in many non-text formats.³¹ The development of the repository has been supported by the Kultur³² project, funded by JISC, and may be seen as a model of good practice. From Kultur has come Kultivate,³³ a project that hopes to establish a sector-wide discipline-based repository for the arts. This is a development which is likely to inform subsequent research by the RCS³⁴: we have plans, subject to agreement from the University of the Arts, to conduct a survey of academics who use their repository; we are hoping to gain some insight into what motivates arts specialists to deposit work, so that activists can more successfully target advocacy in those disciplines.

A blogpost³⁵ by Christopher Pressler, Director of Research Libraries, University of London, notes that the humanities have not figured largely in OA adoption in recent years. Perhaps one reason that arts and humanities researchers use OA less than their STM colleagues is that there is still insufficient clarity about and promotion of the specific benefits for their own research practice and profile that may result. Yet OA, with its ability to link from an article to associated music, image and sound files, or to web pages and social networking sites, can give researchers opportunities to exploit their research in ways that purely text-based publications cannot.

³⁰ There are 413.03 FTE research-active staff in Medicine and Health Sciences, 220.4 FTE in the Faculty of Arts and 193.95 FTE in the Faculty of Science. [Staff numbers from the 2008 RAE submission <http://www.rae.ac.uk/submissions/submissions.aspx?id=165&type=hei>. Biology, which straddles the Faculties of Science and Medicine, has been included in the figures for Medicine; if Biology were moved to Science, the figure for Science (225.85 FTEs) would be very similar to the figure for Arts.]

³¹ <http://ualresearchonline.arts.ac.uk/>

³² <http://kultur.eprints.org/index.htm>

³³ See <http://sonexworkgroup.blogspot.com/2010/09/sonex-at-kulturkultivate-workgroup.html> [accessed 31/11/10]. The success of the Kultivate project's application for JISC funding was announced by email on December 13, 2010.

³⁴ Colleagues in the CRC are likely to be useful contacts whose work can help inform our discussions with academics: Jacqueline Wickham of the RSP has been asked to be on the Advisory Group for Kultivate.

³⁵ Pressler, Christopher, 2010. Free humanities. *Canning Circus*, weblog post, November 26, accessed 30/11/10. <http://canningcircus.blogspot.com/2010/11/free-humanities.html>

1.6 Open Access adding value in scientific practice: open data, open science

References to open science and open data are everywhere. On the one hand there are “citizen science” websites such as Galaxy Zoo³⁶ that harness the enthusiasm of amateur researchers in the interpretation and generation of scientific data. At perhaps the other end of the spectrum are initiatives encouraging the sharing of data among members of the academic scientific community, such as the data management strategy developed for systems biology research data by SysMO,³⁷ and ChemSpider Synthetic Pages³⁸ where chemists can share synthetic methods, reactions and procedures. In some research areas open notebook science is becoming established.³⁹ Meanwhile institutional repositories such as Edinburgh DataShare⁴⁰ are equipping themselves to handle datasets.

JISC is an important player in this area. The DataShare project was funded through the Digital Repositories and Preservation Programme. JISC also supported the development by the Digital Curation Centre of the Data Asset Framework, now available as an online tool to assist institutions in the management of large quantities of complex data. Currently JISC’s Managing Research Data Programme is supporting a range of initiatives in various disciplines, which look set further to advance knowledge, skills and good practice.⁴¹ As these projects come to fruition, advocates of OA will have increasing opportunities to locate OA practice in the context of tools and facilities that make it easier to preserve, manage and present the results of research.⁴²

1.7 Open Access and added value: the next step

These are just a few examples of “added value” services and initiatives that may be of relevance to OA advocacy. In highlighting their possible significance, we are laying the foundations for the next stage of our own research, which will involve direct contact with academic colleagues to test out our theories about what might induce them to take up OA options – and what might dissuade them.

Of course JISC has supported many repository enhancement projects over the years, which have already generated services of the kind referred to above. It would be wrong to imply that they have had little effect. The PRIMO⁴³ archive of practice as research in music, for example, has developed into what one user

³⁶ <http://www.galaxyzoo.org>

³⁷ SysMO-DB: <http://www.sysmo-db.org/start>.

³⁸ <http://cssp.chemspider.com/>. ChemSpider reports that it holds details of nearly 25M compounds from almost 400 data sources.

³⁹ See the UsefulChem site at <http://usefulchem.wikispaces.com/>

⁴⁰ Edinburgh DataShare <http://datashare.is.ed.ac.uk/>

⁴¹ For example ADMIRAL, working on data management for the life sciences; FISHnet, the freshwater information sharing network; PEG-BOARD, looking at OA for research data in palaeoclimate research; SUDAMIH, a data management infrastructure for the humanities; and others.

⁴² It should be said that academics do not necessarily welcome a move towards open science and open data. Carole Goble, speaking on the SysMO-SEEK project at the RIN event on data handling (Royal College of Physicians, November 18, 2010), explained how hard it was to persuade some researchers to share data even with other researchers on the same project. Slides from Prof Goble’s presentation are available here: <http://www.slideshare.net/sarahgentleman/data-sharing-data-management-the-sysmoseek-story>

⁴³ <http://primo.sas.ac.uk/eprints/>

has described as 'an increasingly indispensable tool' that provides value across a number of research activities: articulating, demonstrating and sharing research with others; exemplifying performance and/or practice as research methodologies to students and other interested parties; illustrating non-verbal research across disciplines; and facilitating related funding applications.⁴⁴ In a very different subject area, the eCrystals archive, developed from a JISC project that explored the potential for a data management system for crystallography, now holds 703 records.⁴⁵ However, it has been suggested that the project has not had as much impact on the relevant scientific community as might have been hoped: the hearts and minds of individual chemists are still un-won.⁴⁶ This view reinforces the point made earlier in this report: that there exists a disjunction between the theoretical and strategic acceptance of the concept of OA by institutions, and the emotional and subjective distrust it generates in many individual academics.

After so many years of effort, it may be considered disappointing that OA is still, at least in some academic disciplines, a minority activity. However we know that cultural change is difficult and takes time.⁴⁷ The RCS is working towards an understanding of the unconscious opinions that underlie OA practice.

Section 2: OA and other developments

Looking at the added value that OA and aligned approaches can bring is one side of current developments. The other is looking at what academics themselves are choosing to use. The list of Web2.0 tools that academics and educators are using continues to grow,⁴⁸ and yet it seems there is little awareness of the costs that may lie alongside the benefits of these proprietary based services. Significantly, the academic "social/research space" service Mendeley continues to expand. The RCS March report quoted 16.3M document references or full text available through the site. The July report quoted 34.5M documents. Currently, that figures stands at almost 52M documents⁴⁹, with 653,575 users from 15,557 institutions.⁵⁰ Whatever the specifics of these figures in terms of unique users or documents, duplications or metadata entries, the sheer volume and rapidity of growth is sufficient to warrant attention and give an indication of the popularity of the system, compared to the take up of the repository system. Reasons for

⁴⁴In an email to AH, 10/12/10. The source has been anonymised.

⁴⁵ <http://ecrystals.chem.soton.ac.uk/> [accessed 13/12/10]. Of these 703, 362 are open records – the others are closed.

⁴⁶ By Simon Coles, School of Chemistry, University of Southampton, and Director, UK National Crystallography Service, in a telephone conversation with AH, 13/12/10. Dr Coles suggested that it was a tactical mistake originally to "badge" the project as engaged with open access, feeling that scientists were less inclined to commit to an open access initiative than they would have been to one mainly purporting to improve data management.

⁴⁷ Among research articles on this subject, see Macnaghten, Phil & Jacobs, Michael, 1997. Public identification with sustainable development: investigating cultural barriers to participation. *Global Environmental Change*, 7/1, 5-24; Verplanken, Bas & Wood, Wendy, 2006. Interventions to break and create consumer habits. *Journal of Public Policy and Marketing*, 25/1, 90-103; and Wood, Wendy & Neal, David T, 2007. A new look at habits and the habit-goal interface. *Psychological Review*, 114/4, 843-863.

⁴⁸ For example, see The 35 Best Web 2.0 Classroom Tools Chosen by You.

<http://edudemic.com/2010/07/the-35-best-web-2-0-classroom-tools-chosen-by-you/>

⁴⁹ 51,961,047 papers, accessed 30/11/10

⁵⁰ The detail of these figures is unclear, with duplication, test registrations, dummy entries, errors and inappropriate registrations almost certain. Most articles are also metadata only, as, it has to be said, is also the case in repositories as well.

the popularity seem varied: in conversation⁵¹, academics report using it primarily as a bibliographic tool, but at the same time talk enthusiastically about contacting other colleagues through the system and sharing information. When asked, there was no clear indication of its advantage as a bibliographic system over existing tools such as EndNote, so it may be that the reported subsidiary benefits are the true unconscious drivers.

As such, although it remains to be seen how well supported this particular service will be after the initial burst of novelty and enthusiasm, this does point towards a trend in research communication that we can see in other non-academic areas. This well known trend is for the creation of ground-up communication networks,⁵² using ground-up methodologies and emergent taxonomies, groups and protocols, both technical and social. This has been a feature of Web2.0 social networking and shared tools such as Facebook, Flickr etc, but its application as a research communication tool is intriguing. While other Web2.0 tools have been used by academics⁵³ for research purposes⁵⁴, "social" tools like Mendeley, Academia.edu⁵⁵ and ResearchGate⁵⁶ are aimed at becoming embedded within the research culture as a communication and information mechanism.

These developments seem exciting and beneficial: communities creating their own networks and ways of communicating. This has led to the massive growth of such services, now including those which are targeted at research support. However, such apparent freedoms can mask some quite restrictive mechanics. The emergent methods and behaviours are rarely as free and community-sourced as they might first appear: for example, Mendeley itself is, inevitably, a formal framework within which development and social experimentation occurs. Mendeley underwent 2.5 years of development and required substantial investment on the scale of other commercial information services before its launch. This is in line with other comparator Web2.0 services in other areas, which may start as small "garage projects", but which quickly amass significant developmental frameworks, potentially restrictive structures and commercial imperatives. While it is too soon for such restrictions, if they exist, to arise within such Web2.0 research tools, none the less, the authors of this report have identified this as a strategic concern. As proprietary software systems that are used by individuals and exist outside formal service contracts with institutions, notice has to be taken of the business drivers and structures of such services if they are to be used as underpinning future research practice.

⁵¹ Series of meeting with Deans of Faculty within University of Nottingham; Science Online London Conference, British Library 3-4 September 2010.

⁵² For example, "Mendeley goes beyond a technology platform – we are helping to create a movement for academic and industry researchers who want to collaborate with like-minded people and discover research trends," Jan Reichelt, co-founder of Mendeley: <http://bit.ly/eu7jaP>

⁵³ RIN Report: "If you build it, will they come? How researchers perceive and use Web2.0" actually showed low levels of Web2.0 use, with what usage there was as non-essential, summarised as "Even frequent users tend to see web 2.0 services as an addition to, rather than a replacement for, traditional scholarly communications techniques." This report did not cover specific social tools such as Mendeley, or ResearchGate, but examined blogs and wikis as the main Web2.0 tools for sharing scholarly content. <http://bit.ly/4juYod>

⁵⁴ For example, sharing video material through YouTube, PowerPoint slides through SlideShare, or using tools like Wordle, or an environment like Second Life within their research practice

⁵⁵ <http://www.academia.edu/>

⁵⁶ <http://www.researchgate.net/>

For example, outside the HE and research sector, questions have been asked about the policies of Facebook⁵⁷ regarding the use of the data it accumulates, changes to its services and unpublicised implications and issues which address personal freedom and data security. While there is no suggestion that current Web2.0 tools for researchers have similar issues with their service, these same questions have begun to arise from users.⁵⁸ This is a reminder that such services are still fundamentally commercial in nature and may well bring conflicts of interest into the area they serve. Within the sector, such concerns and tie-ins to commercial systems are beginning to be expressed and discussed on blogs.⁵⁹

Part of the current drive towards Open Access is to free up the research process from the commercial limitations it has adopted by default, through the commercial system of subscriptions, journals, journal brands and impact factors. None of these restrictions were intentional within the original system, but arose from commercial drivers operating within the system. It would be ironic if at the point of freeing research communications from one set of restrictions, researchers unwittingly tied themselves into another.

The system of Open Access through Repositories and OA journals (OAR/J) now finds itself being challenged by some Web2.0 services and can even be seen as being cast into a defensive position. Instead of being seen as a potential liberator, the OAR/J axis may now seem restrictive itself, modelled as it currently is on the traditional publication system. While there is work underway to help repositories in particular to move out of this tradition and start to hold integrated research outputs⁶⁰ (articles, data and grey literature), support long-term peer-review etc, the basis of the repository system revolves around articles and formal metadata descriptions.

The authors consider that similar concerns exist within search. One intention of the OAI-PMH was to facilitate search through the use of a formal metadata structure. The system was created before Google and other full-text search facilities became established. The addition, authorship and composition of metadata have always been seen as potential restrictions for repositories and are still problematic. Successive straw polls⁶¹ amongst repository managers show that almost all will check, extend or replace metadata for their holdings at additional cost: very few rely entirely on author-generated metadata. But is it used?

⁵⁷ For example, Facebook bows to pressure to simplify privacy controls <http://www.independent.co.uk/life-style/gadgets-and-tech/news/facebook-bows-to-pressure-to-simplify-privacy-controls-1983920.html> and European Commission responses <http://europa.eu/rapid/pressReleasesAction.do?reference=IP/10/1462&format=HTML&aged=0&language=EN&guiLanguage=fr>

⁵⁸ Comments from some Mendeley users do demonstrate concern. See comments from Brain Hanley <http://feedback.mendeley.com/forums/4941-mendeley-feedback/suggestions/1230827-tell-us-how-mendeley-is-going-to-support-itself-?ref=comments> and Lambert Heller <http://www.mendeley.com/blog/open-access/researcher-which-side-of-history/#comment-107462>

⁵⁹ The Chronicle of Higher Education: <http://chronicle.com/blogs/profhacker/using-mendeley-for-research-management/25627>

⁶⁰ The previously referenced Edinburgh DataShare <http://datashare.is.ed.ac.uk/> and much work sponsored by JISC through the MRD programme: <http://www.jisc.ac.uk/whatwedo/programmes/mrd.aspx>

⁶¹ Informal polls at RSP events for repository managers during 2010: the RSP is currently undertaking more detailed survey work.

Full text searching using Google, Alta Vista or Bing or others has now become the reported norm⁶² for academic researchers, even if only as a "first pass", and OAI-PMH style searches begin to look fairly old-fashioned, no matter that they can be more precise and analytical. One of the advantages of more formal search is that it operates on a known system with known mechanics and resources. The databases that are searched can be listed or chosen: the results that are returned are based on a known, or knowable, algorithm. Therefore, researchers can be assured of the comprehensiveness of that search within known bounds. Other search services, such as Google, Alta Vista or Bing are commercial services, with proprietary algorithms to select results, order results, promote selected results etc. The user does not know the extent of the search. Google already gives different results based on the same search in its different domains: for example, www.google.com and www.google.co.uk. Google, Bing and others, are now moving towards explicitly selective searches, based on data they hold or can gather about the user.⁶³

This issue is discussed in general terms within the library and information science community,⁶⁴ and there are signs of concern from academics using the service.⁶⁵ The authors consider such proprietary search mechanisms as a potential future issue where academic search is concerned: not so much that there are particular search filters, but that as a principal there are unknown and commercially secret systems influencing what is found. This has worrying implications for future research if commercial decisions lead to emphasis or quashing of particular search results: maybe from one country, a commercial interest, etc. For example, Google has already suppressed search results on request from at least one government⁶⁶ and is already the subject of an anti-trust probe from the EU for bias from commercial pressures.⁶⁷

So, as a trend, there is a general move among researchers towards free-text Google-style search from commercial companies⁶⁸ as there is a move towards Web2.0 style mounting, sharing of articles and other research information, again, based on commercial company services. The authors feel that the question has to be asked: how suitable are these tools? What controls exist for their modification or for exposure of their mechanics and methodologies?

Current commercial systems, like library-based search services, are typically sold to institutions with a consequent measure of institutional overview and control being possible. Web2.0-based services typically operate on a more diffuse commercial model and are adopted by individuals free at the point of

⁶² Feedback from librarians as an accepted situation through lifespan of RSP.

⁶³ Why the future of search is social <http://www.bbc.co.uk/news/technology-11797840>

BING deepens ties with Facebook <http://www.bbc.co.uk/news/technology-11540661>

⁶⁴ For example, academic paper: Through the Google Goggles: Sociopolitical Bias in Search Engine Design: <http://www.springerlink.com/content/w82586k8264p4v76/>; blog discussion: <http://econsultancy.com/uk/blog/6855-google-bias-caught-red-handed>; analysis of bias: <http://www.benedelman.org/hardcoding/>

⁶⁵ See van Dijck, José, 2010. Search engines and the production of academic knowledge. *International Journal of Cultural Studies*, 13/6, 574-592. DOI: 10.1177/1367877910376582. The article is summarised on the science discussion website *Science a-go-go*: http://www.scienceagogo.com/news/information_insurgency.shtml

⁶⁶ China: <http://www.guardian.co.uk/technology/2006/jun/07/news.searchengines>

⁶⁷ <http://www.bbc.co.uk/news/technology-11876443>

⁶⁸ For example, see the JISC report: "The digital information seeker" a meta-analysis drawing from work 2005-09: <http://www.jisc.ac.uk/publications/reports/2010/digitalinformationseekers.aspx>

use. By taking the commercial base away from a direct institution to supplier relationship, there is also lost any idea of service-level agreements, or contract-based assurances of independence from political or commercial influence in the service.

It should be emphasised that this report does not denigrate Web2.0-style services from some assumed position of moral high ground; or seek to criticise the services for what they are (or are not); or not recognise the excellence and the innovation of the services. It is simply that the context of such services is important if we are to adopt them to the extent of underpinning research communication. If adoption and use is at the level of the individual, and if concerns become justified, it may be a more difficult task to deal with than cancelling a traditional service contract.

While we are at a crossroads in the development of new research communications, we have to note there is a risk if such services become embedded in a new standard research practice, even if using open access materials. Research communications could find itself locked into a new commercial paradigm, just as it moves from behind the toll-gates of traditional publishing.

As we have seen with the traditional subscription model, change from any standard practice can be extremely difficult simply because of inertia, existing workflows and reward and esteem mechanisms being established on top of inappropriate systems. Such trends cannot be stopped, but need to be accommodated. Public academic services and commercial service providers need to respond to the challenge brought by social media to create a neutral and independent research work environment.

We are therefore moving into a critical period for research communications where we have to recognise an overall strategic view of research as a process between funders, researchers and institutions, with other actors (publishers, Web2.0 systems, research support offices, libraries, repositories, search services) as service providers rather than process drivers. As services, these need to have transparent and neutral operational methodologies.

The challenge for traditional services (libraries, publishers) may lie in putting in place a quality-assured system as an accompaniment, alternative or match for the ease of use and flexibility of commercial Web2.0 systems. Such projects as JISC-funded DURA, (noted in the previous report), that are working with Mendeley are to be both applauded and encouraged as an approach. Many individual technical components are largely in place for a more integrated workflow: what is needed is for funders, research grant administrators, principal investigators, authors, repositories, libraries and research assessors to see themselves as part of a workflow and to ensure that information flows alongside the research to facilitate its handling.⁶⁹ Projects to reach across this range of stakeholders may need innovative funding profiles from a variety of funders

⁶⁹ JISC is working in this area: for example, RCS is organising an event previously referenced "Research Management - Smoothing the Way" for some of these stakeholders <http://crc.nottingham.ac.uk/events/?page=Researchmanagement-2011-01-27>

including JISC, together with oversight across traditionally quite diverse professional areas, but such integration work is essential.

Bill Hubbard, Head of the CRC,
JISC Research Communications Strategist

Amanda Hodgson, Open Access Advisor

Willow Fuchs, Open Access Advisor

Centre for Research Communications
University of Nottingham

Appendix

This report is based on formal and informal contacts between the authors and stakeholders from various sections of the HE community. In the last few months we have conducted three seminars with research staff in Russell Group universities and have gathered the views of around 40 academic colleagues from this. We have interviewed 9 Deans of Faculty or Heads of School within Nottingham on the future of research publishing and communications. We have held a meeting with Astrid van der Wesenbeeck, Director of SPARCEurope, on future directions of OA and European support and talked to Paul Ayris as President of LIBER about development work being undertaken by that group. For the section referring to JISC repository enhancement projects a conversation was had by phone or email with people directly affected by the outcome of the selected projects. RCS staff have spoken to representatives from various projects and services including Symplectic, Mendeley, Xpert, Kultur, SNEEP, JazzHub, eCrystals and PRIMO.

RCS staff have attended events⁷⁰ organised by RSP, RIN, RIM group and others and through these spoken and listened to numerous academics, repository administrators, managers, librarians, funders, publishers and consultants, which has helped to inform both the direction and content of the report. We have also drawn on statements made at conferences, in print, as blogposts and in conversation by significant figures in the scholarly communications world - all are documented in the footnotes to the report.

⁷⁰ eg

- Quality Assurance – Responding to a Changing Information World, RIN event, 13th December 2010, London
- Open Access: the impact for libraries and librarians, 10th December 2010, RIBA, London
- Research Data- Policies and Behaviours, RIN event, 18th November 2010, London
- Doing it differently, 27th October 2010, Sheffield
- RIM group meeting, 13th October 2010, Woburn House, London
- The Future of Scholarly Publishing: Where do we go from here?, RIN event, 11th October, London
- Vitae Researcher Development Conference, 6th September 2010, Manchester
- Workshop for Repository Administrators, 11th August 2010, Oxford